Euphonix

digital emotion

Digital Audio Mixing Systems for Broadcast

Mixing Audio for HD

With new HD standards currently being adopted by stations throughout the world, the audience demands higher quality audio and, in many cases, surround sound. Audio operators also have to handle increasingly complex productions with ease. From news to sports to production, in the studio or on the road, Euphonix has a range of flexible and modular digital audio mixing solutions, from 32 to over 1,000 channels, that can be tailored to exactly meet any facility's requirements.

Updates for Broadcast

The Euphonix broadcast line now features some significant new product updates:

System 5

Updated control surface with...

- New touch-sensitive LED color coded knobs
- Higher resolution screens
- Faster embedded processors for quicker boot times
- More memory for added features and faster response
- Improved fader resolution around 0dB

Max Air

Updated control surface with...

- Improved surface color coding
- New external screen metering option
- Faster embedded processors for quicker boot times
- More memory for added features and faster response
- Improved fader resolution around 0dB
- New speaker shelf design

New DF66 DSP SuperCore

New Modular Converters

System 5-B and Max Air

Two models are available for different applications and budgets. Both use the same DSP SuperCore, router and range of converters and share many of the same features. What sets them apart is the control surface.

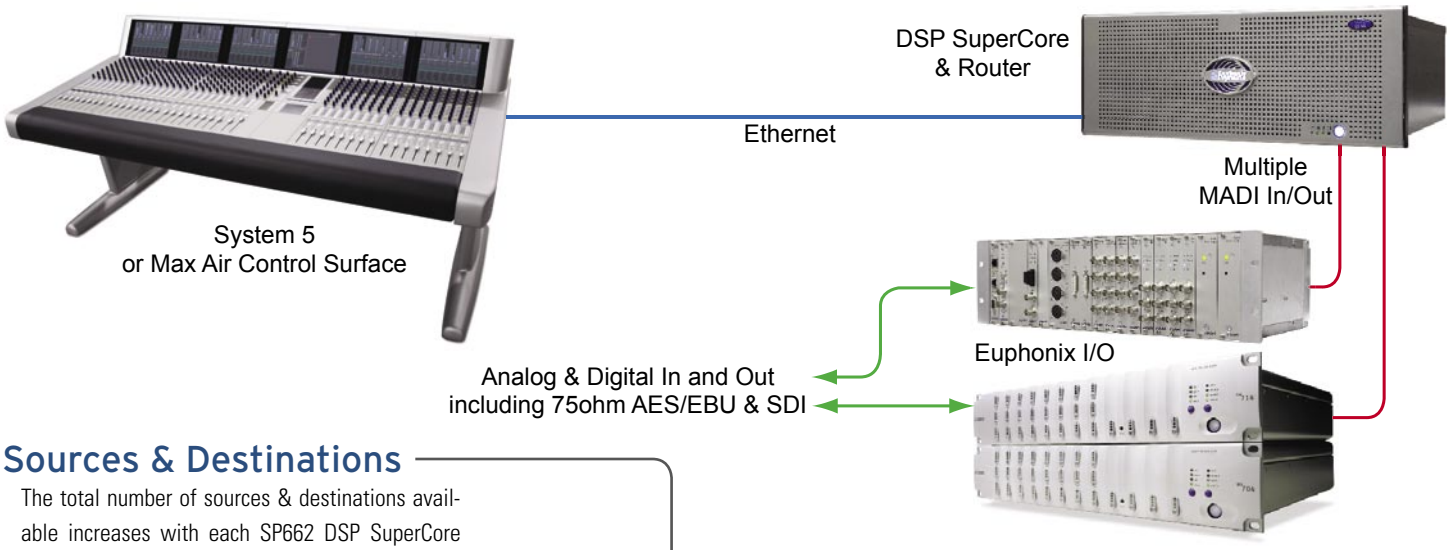
System 5-B

The most advanced digital broadcast mixing system available. It is designed for audio professionals who demand the best. With 8 knobs per channel and TFT displays for metering, routing and parameter display, System 5 is built for the ultimate in operational flexibility and visual feedback.

Max Air

A more compact control surface with 4 knobs per channel and a central touch screen interface making it very easy to learn and use. Max Air is ideal for one operator to handle everything from on-air news to production and outside broadcasts.

System Architecture



Sources & Destinations

The total number of sources & destinations available increases with each SP662 DSP SuperCore card added to the system. Each card includes 4 MADI (224) inputs and outputs. A typical 3 card system with 12 MADI inputs and outputs, each MADI stream capable of 56 channels of digital audio, will have 672 sources and destinations.

Channels

The sources are routed to the console's channels using the PatchNet software.

Each channel has:

- 2 inputs, that may be fed from analog or digital sources. Either A, B or A + B may be selected to feed the channel.
- Phase reverse
- Digital gain trim
- Delay - 2 seconds per channel
- Insert send & return
- 4 band fully parametric EQ & 2 filters
- Full dynamics including compressor and expand-gate, key input and side chain filter
- Touch sensitive moving fader
- Multi-format panning to mix & group busses
- Multi-format mix and group busses
- Mono/stereo group/clean feed busses
- Aux/IFB send busses
- Solo (APL, PFL, SIP)
- 2 direct outputs - pre-fader & post-fader
- N-1 mix-minus output from each channel

When Euphonix remote mic preamps are connected to the channel these controls are also available:

- Input impedance - hi/lo
- Phantom power
- High pass filter
- Analog input gain

Busses

The number of busses available depends on:

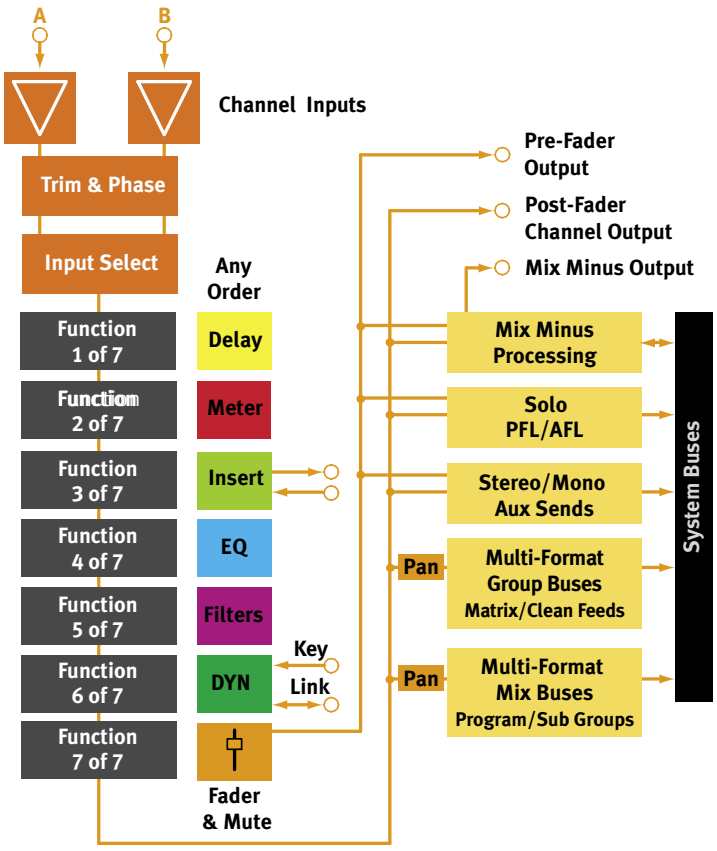
- The number of SP662 DSP SuperCore cards
- Mixer Model (software defined mixer configuration)

Three types of busses are available:

- Up to 48 for Multi-Format Mix Busses
- Up to 48 for Multi-Format Group Busses
- Up to 24 for Mono/Stereo Aux Sends

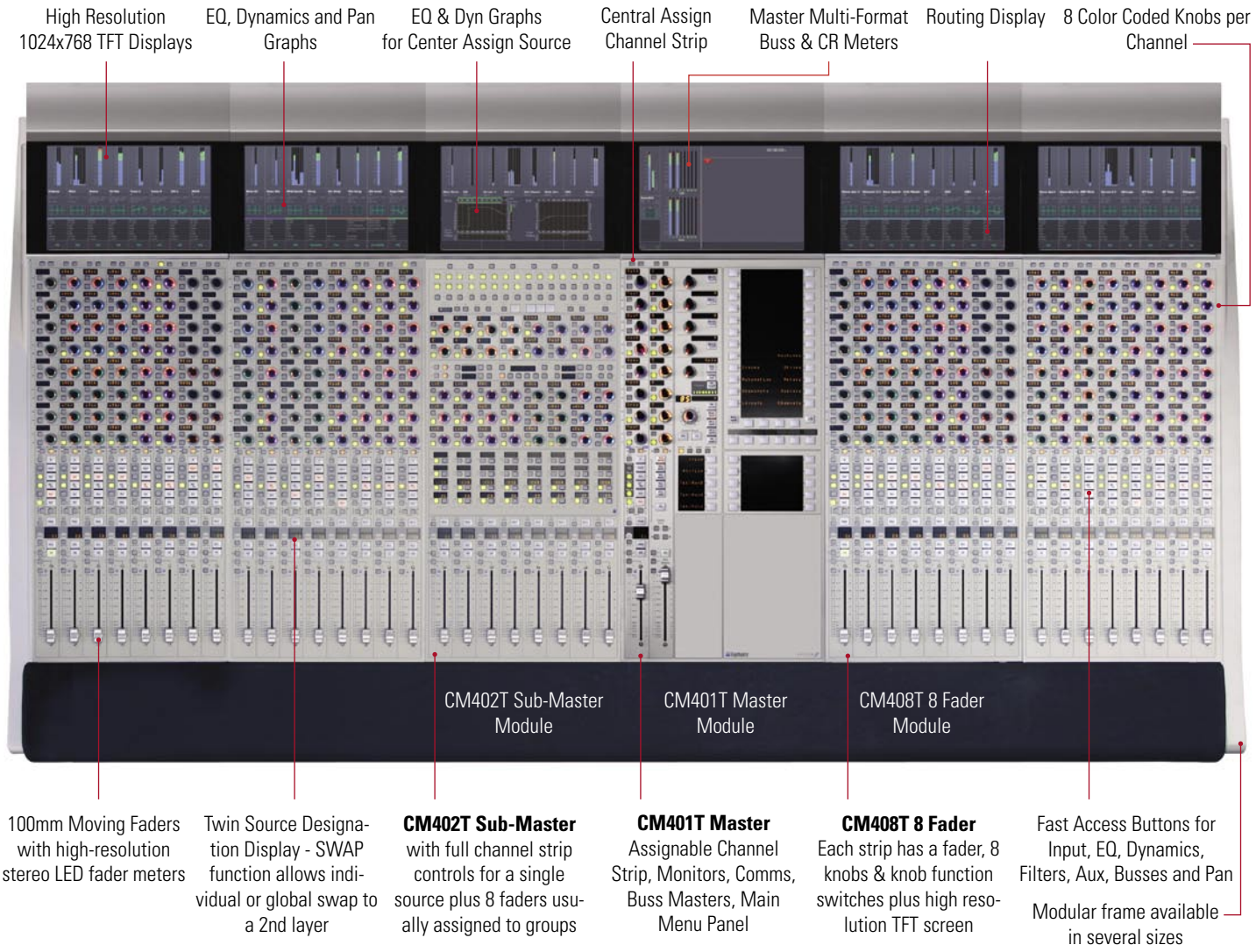
Mix & Group busses can easily be formatted in stereo or surround (up to 7.1 including LCRS and 5.1). Audio subgroups may be built when needed from available busses. Filters & Dynamics buss processing is available.

Busses may be placed on any channel strip for full control of master level and processing using the 8 knobs and screen displays.



System 5-B Control Surface

New LED color coded knobs, higher resolution TFT screens with improved graphics, and improved surface color coding for clearer display


High Resolution 1024x768 TFT Displays
EQ, Dynamics and Pan Graphs
EQ & Dyn Graphs for Center Assign Source
Central Assign Channel Strip
Master Multi-Format Buss & CR Meters
Routing Display
8 Color Coded Knobs per Channel
CM402T Sub-Master Module
CM401T Master Module
CM408T 8 Fader Module
100mm Moving Faders with high-resolution stereo LED fader meters
Twin Source Designation Display - SWAP function allows individual or global swap to a 2nd layer
CM402T Sub-Master with full channel strip controls for a single source plus 8 faders usually assigned to groups
CM401T Master Assignable Channel Strip, Monitors, Comms, Buss Masters, Main Menu Panel
CM408T 8 Fader Each strip has a fader, 8 knobs & knob function switches plus high resolution TFT screen
Fast Access Buttons for Input, EQ, Dynamics, Filters, Aux, Busses and Pan
Modular frame available in several sizes

Control Surface

Much like any audio console the System 5-B's surface includes channel strips and a center section for master facilities. The System 5-B surface is modular and comprises of 5 different modules:

- CM401T Master (1ft wide, 305mm)*
- CM402T Sub-Master (1ft wide, 305mm)*
- CM408T 8 Fader Strips (1ft wide, 305mm)*
- CM409 Blank Module (1ft wide, 305mm)
- CM411v Video Module (1ft wide, 305mm)*

* Includes TFT screen display 1024x768

System 5 can be supplied without a frame for custom installs. Each module is self-contained with dual redundant power supplies and an Ethernet connection for control. Modules may be placed in any order and can easily be moved. If a fader module fails, there no loss of audio, and it is easy to use other modules to control those sources and to hot swap the module.

eMix

eMix is the application that integrates with System 5 and provides setup, file management and the PatchNet patchbay application. It supports the following features accessed from an external screen:

- Directory & File Management
- PatchNet
- System Diagnostics and Mixer Models
- Mix & Group Buss Setup
- Monitor Fold Down & External Inputs Setup
- Events & GPI System Programming

Modular Frame Sizes (Custom Available)			
Frame	Height	Width	Depth
6 modules	39.5" (1 m)	6'10" (2.08m)	41" (1.04m)
9 modules	39.5" (1 m)	9'10" (3m)	41" (1.04m)
12 modules	39.5" (1 m)	12'10" (3.9m)	41" (1.04m)

Channel Strip - CM408T

Includes 8 knobs, that can quickly be switched to control Input, EQ, Filters, Dynamics, Pan and Buss Routing, plus a high resolution screen for display, the System 5 is the ultimate channel control strip.

TFT Screen Display:

High Resolution
Multi-Format Metering up to 7,1

Router Source Name
Source Info
EQ & Pan Curves

Routing Indicators

Knobset Function

Touch Sensitive Knobset:
8 knobs each with
LED color coded outer rings,
4 character displays,
and two switches
for process on/off

Knobset Function Select:
selects the 8 knobs to control
Input, Dyn, Eq, Filters, Aux,
Pan or Routing

Swap the Strip between the
Main and secondary Swap Source

Fader:
twin 4 character designations
- may be linked to the facility
router, Talkback, Solo, Channel
On, Channel Select key for bring-
ing up the source in the center of
the console, 100mm long-throw,
touch sensitive, motorized fader,
twin hi-res LED meters

Master Module - CM401T

Includes a full assignable channel strip, 8 knobs for Buss Masters, plus Monitoring and Comms controls. The Main Panel menu is used for setup and recall of Layouts & SnapShots, Channel Assign, Meters and Strip Setup.

Main Panel Menu System
24 buttons each with 10 character display

Central
Assign Strip

A,B,C & D SLS
Monitors

Solo

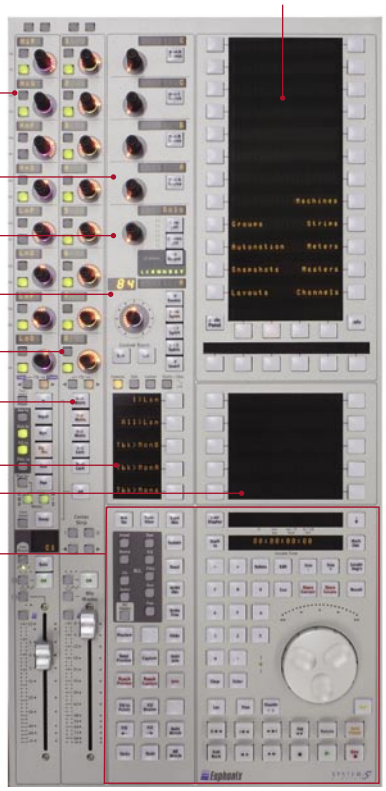
CR Monitors

Buss Masters

Buss Master Select

Comms Panel
Sub-Panel

Automation & Trans-
port Controls for the
System 5-BP ONLY.
This panel is blank for
System 5-B.



Sub-Master Module - CM402T

The optional sub-master central assign module adds a complete set of channel strip controls including dedicated knobs for EQ, Filters, Dynamics and Aux Sends plus 48 dedicated Routing Buttons. There is also a section of 32 buttons and displays for selecting any source to the center as well as 8 faders that are usually assigned to control group masters. The high-resolution screen adds a further 8 programmable meter group displays as well as large EQ and dynamics graphs.

Metering

Every channel includes high-resolution multi-format metering on the TFT screen for display of sources, channels, auxes and groups as well as gain reduction. There is also stereo hi-resolution LED metering next to each fader. The central CM402T sub-master module offers 8 extra programmable meter displays and the CM401T master module has multi-format metering of the main busses and monitors. Meter displays may be customized and saved as setups - for example the channel strip meters can show both the SWAP and MAIN meters above each other.

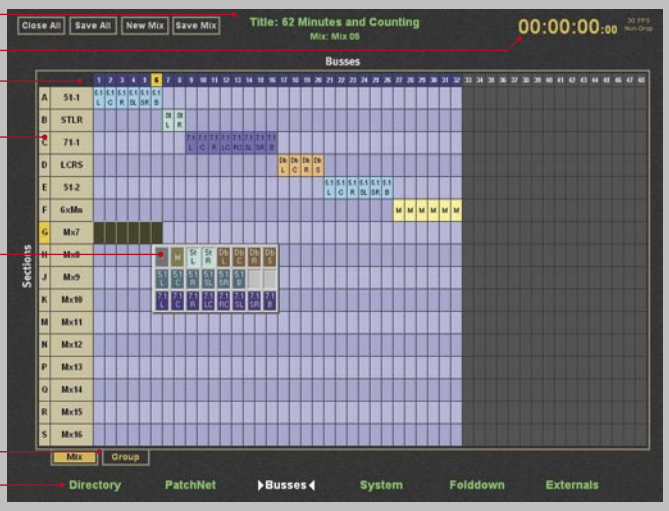
eMix External Screen - Showing Mix Buss Setup

Title
Timecode Reader
Buss number

Designations for Mix
Sections

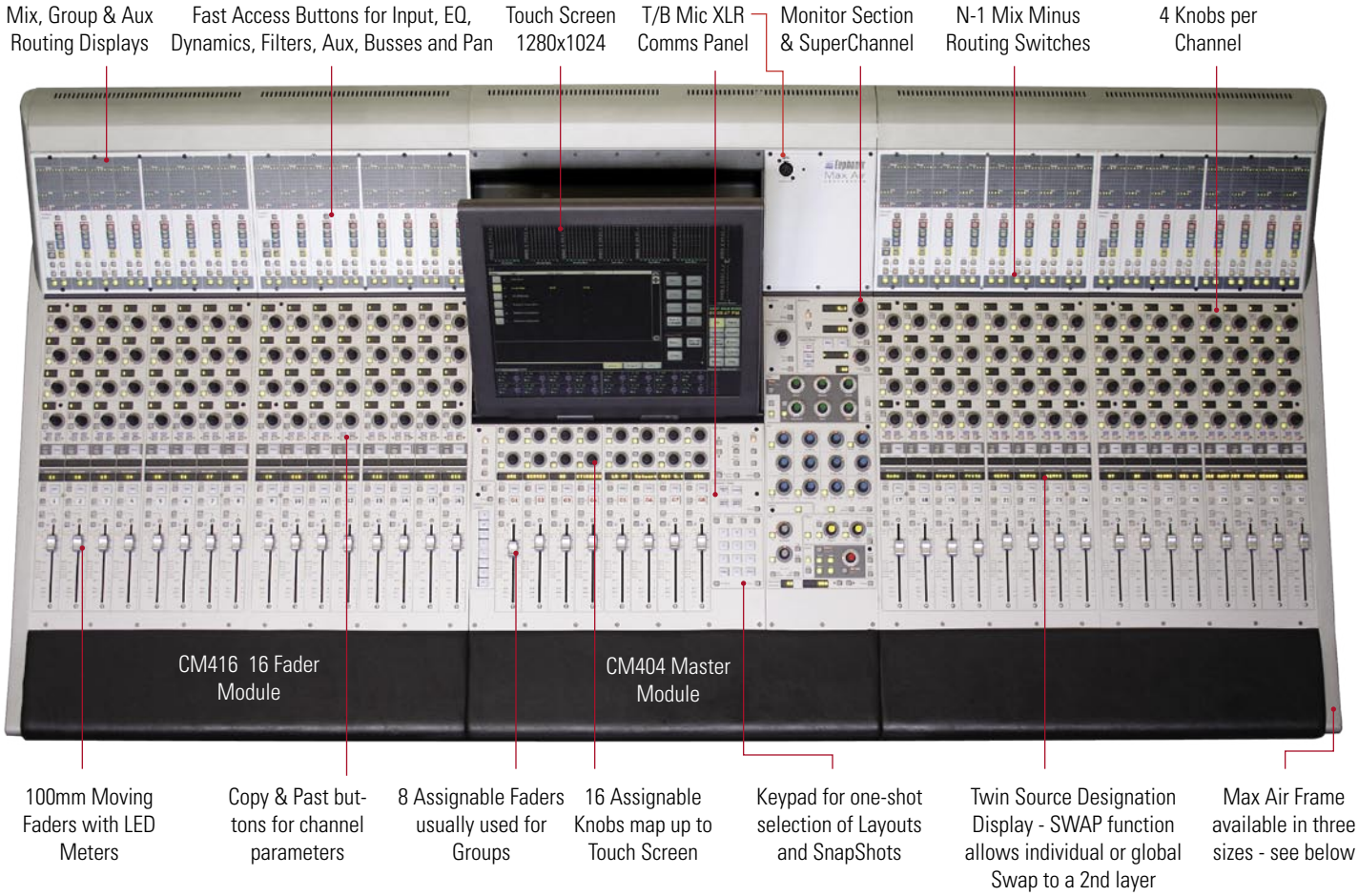
Pan Law Palette for
setting format
of selected busses

Tabs to Group Busses
eMix Pages



Max Air Control Surface

New color coded knobs & switches and improved surface color coding for clearer display


Mix, Group & Aux Routing Displays
Fast Access Buttons for Input, EQ, Dynamics, Filters, Aux, Busses and Pan
Touch Screen 1280x1024
T/B Mic XLR Comms Panel
Monitor Section & SuperChannel
N-1 Mix Minus Routing Switches
4 Knobs per Channel
CM416 16 Fader Module
CM404 Master Module
100mm Moving Faders with LED Meters
Copy & Past buttons for channel parameters
8 Assignable Faders usually used for Groups
16 Assignable Knobs map up to Touch Screen
Keypad for one-shot selection of Layouts and SnapShots
Twin Source Designation Display - SWAP function allows individual or global Swap to a 2nd layer
Max Air Frame available in three sizes - see below

Control Surface

Max Air has been designed to be easy to learn and fast to operate with controls and displays following traditional conventions and layout. The innovative central touch screen simplifies many of the master functions such as patching.

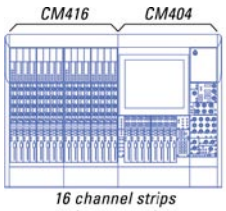
Each channel strip has 4 knobs that can be selected to control input, EQ, filters, dynamics, aux sends as well as routing the source to busses. Custom knobset configurations can be setup to allow the operator to put the most often used controls on the surface at the push of a button. Any source may be brought to the central SuperChannel for access to all controls.

Two surface modules are available each with dual power supplies. Connections to the system are CAT5 Ethernet so placement is not restricted by complex cabling. No audio flows through the control surface as the audio electronics are housed remotely. As with System 5, the loss of a fader module does not interrupt audio, control can be switched to other modules.

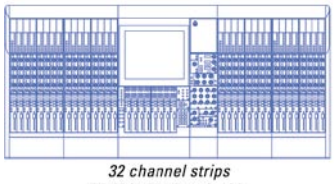
Control Surface Dimensions

Max Air may be supplied with a frame or can be table/custom mounted.

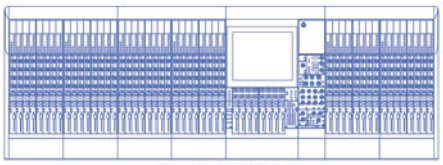
CM416 & CM404 Modules
width 22.3" (566mm)



16 channel strips
48.6" (1,234.5mm) wide



32 channel strips
72.9" (1,851.7mm) wide



48 channel strips
97.2" (2,468.9mm) wide

modules may be placed in any order
only connections are power & ethernet
front-back depth inc. buffer 35.4" (900mm), no buffer 29.6"(751mm)

The Touch Screen

The touch screen gives the operator simple graphical access to the master functions and setup pages for each area of the console. Mix and Group busses can be setup in any format plus there are pages for reverse interrogation. File functions such as saving the setup for a show, as well as the PatchNet digital patchbay are also accessed via the touch screen. When selected to show SuperChannel the screen shows all parameters of the centrally assigned channel as shown on the next page. Backup SXVGA and keyboard/mouse facilities are available.

Channel Strip

The Max Air channel strip can be swapped individually or globally between two sources - useful for backup source selection. All controls are clearly labelled and operation is straightforward and fast.

Routing Display:
Group, Aux and Mix Sections

Knobset Function Select:
selects the 4 knobs to control input, Dyn, Eq, Filters, Aux, Pan or Buss Routing

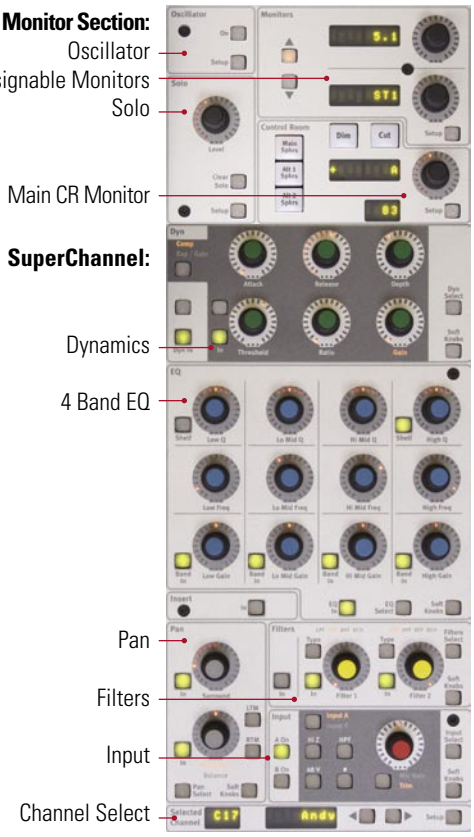
Knobset:
4 knobs with 4 character displays & switches

Swap the Strip between the Main and secondary Swap Source, Talkback button

Fader: twin 8 character designations (that may be linked to the facility router), Solo, Channel On, Channel Select, 100mm touch motorized fader, twin LED meters

SuperChannel

To the right of the touch screen in the center of the console is the SuperChannel. Any source can be quickly assigned to this area which includes full controls for all parameters in the channel.



Monitor Section:
Oscillator
4 Assignable Monitors
Solo
Main CR Monitor

SuperChannel:
Dynamics
4 Band EQ
Pan
Filters
Input
Channel Select

Metering

Every channel includes level and gain reduction metering next to the fader. The central touch screen can be programmed to show any combination of metering at the top including main program. An optional external metering package can be fitted offering 28 meter groups that can be custom arranged on an external monitor.

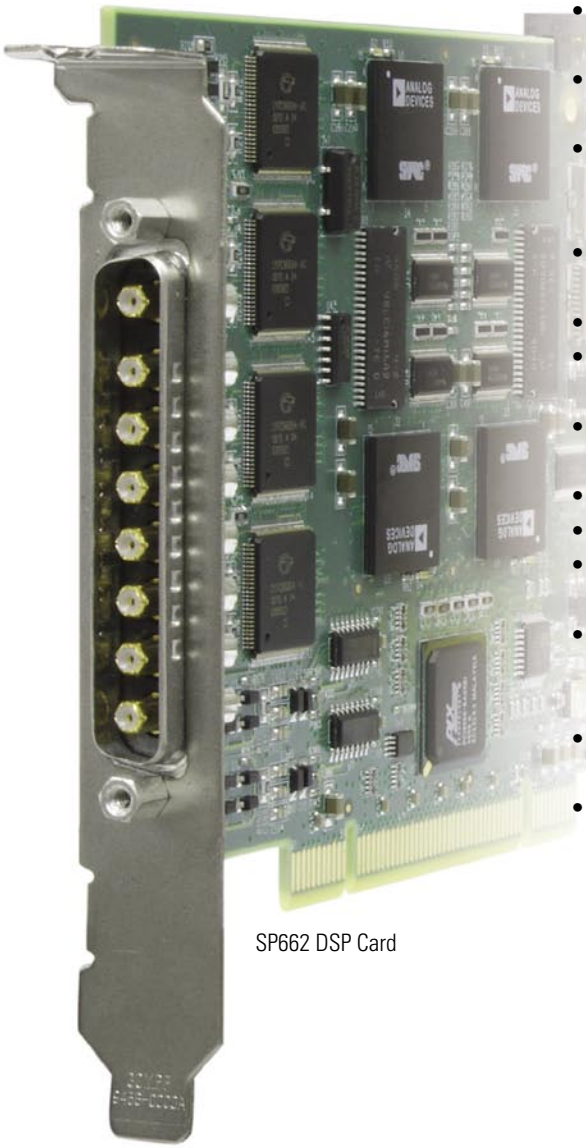
Touch Screen - Showing Mapped SuperChannel (in center of the screen)

DF66 DSP SuperCore with MADI I/O & Router

The new lightweight and compact DF66 DSP SuperCore is the primary signal-processing engine and router for System 5 and Max Air digital mixing consoles. It is comprised of a system board and up to six plug-in SP662 DSP cards. The new SuperCore has more than enough DSP horsepower, system functionality, and reliability to satisfy today's demanding broadcast applications.

The DSP SuperCore provides:

- **DSP Processing** - Massive amount of scalable DSP available for fully featured channels and busses with Delay, EQ & Dynamics processing. Each SP662 card adds 4.8 GFLOPS of processing power.
- **MADI I/O** - each SP662 card adds 4 MADI inputs and outputs (224 x 224 paths at 48KHz)
- **Broadcast Router** controlled by the console's PatchNet Software



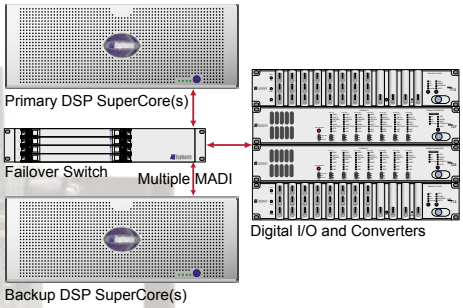
SP662 DSP Card

DSP SuperCore Features

The DSP SuperCore is packed with advanced features that stand out from the competition:

- Compact, lightweight, modular and scalable
- Accommodates from 32 to over 1,000 channels of audio with full EQ & dynamics at 48KHz
- Over 300 signal paths with full EQ & dynamics processing per DSP SuperCore at 48kHz
- Up to 4 SuperCores can be linked together - proprietary linking design maintains full floating-point resolution throughout the signal path
- Independent EQ and dynamics processing plus up to 2 seconds delay for each channel
- Buss processing with dynamics and filters
- 4,096-path FPGA audio router on each SP662 DSP card
- Up to 24x24 MADI I/O (1344x1344 paths @ 48kHz) per DSP SuperCore
- Optional 100% failover redundancy
- Hardware compatible with 192/384 kHz
- DSPs support 40 bit, 32 bit IEEE floating point and 32 bit fixed point formats
- Hybrid FPGA and DSP technology to accommodate 40 bit floating point (extended precision) operation, for timing precision, and wide feature set
- Parallel signal processing utilizing SIMD (Single Instruction Multiple Data) architecture
- Optional SNMP System Management Controller remotely monitors operating conditions and notifies the user to take action to avert system failure

100% Failover Redundancy



For broadcast installations Euphonix supplies a backup DSP SuperCore in parallel with the primary unit and is the only total redundancy system available on the market - another Euphonix first. **This ensures complete redundancy of the MADI I/O, Router and DSP Processing!**

All audio signals are distributed to both the primary and backup DSP cores. If the diagnostics system detects a fault the operator is notified and given the option to failover the system. In addition, the operator can, at his discretion, fail over the system at any time. Linked DSP SuperCores in the primary and backup systems work as one contiguous DSP core. Even with multiple linked cores, the failover function switches all I/O over to the backup system.

SNMP System Management

The DF66 includes dual redundant power supplies and can be fitted with optional SNMP System Management Controller which remotely monitors a wide variety of internal system conditions and notifies the user to take action to avert system failure via email, pager or the web. Battery backup ensures operation even when power fails.

Converters & I/O

Euphonix has a wide range of converters products to cover every installation – from highly modular racks that can be customized with individual cards, to larger 24-channel converter modules and 56-channel digital format converters. Converters and mic preamps may be shared between multiple consoles.

New Modular I/O System

The new range of modular converters is based around a 3RU 19" chassis conforming to the DIN 41494 specification with dual power supplies. Cards may be fitted in slots at the front and the rear for high density configurations. 10 different input/output cards are available offering many different combinations including:

- MADI Interface Module (coax or fiber)
- 4ch SDI De/Embedder Module
- 8ch SDI De/Embedder Module
- 8ch HD/SD SDI De/Embedder
- 4 Ch AES/EBU Input/Output Module
- 8 Ch AES/EBU Input Module
- 8 Ch AES/EBU Output Module
- 4 Ch Analog Line Input Module
- 4 Ch Analog Line Output Module
- 4 Ch Microphone Input Module
- Ethernet Remote Control Module
- Sync Module
- Power Module

Multi-Channel Converters, Remote Mic Preamplifiers & Fiber MADI Extender

2RU form factor multi-channel converters:

- **AM713**
  26 Analog XLR & 2 AES/EBU to MADI
- **MA703**
  MADI to 26 Analog XLR & 2 AES/EBU
- **DM714**
  24 75Ω or 110 Ω AES/EBU to MADI
- **MD704**
  MADI to 24 75Ω or 110Ω AES/EBU
- **ML530**
  24 Remote Controlled Mic Preamps
- **FC726**
  56-channel bi-directional Digital Format Converter AES/EBU, MADI, SPDIF-2, ProDigi, TDIF and ADAT Optical
- **FT730 FiberTran Extender**
  Extends MADI and Digital Sync or the Euphonix TCC control for the ML530 mic preamps or the MC524 monitor controller, up to 1km over fiber optic cable.

PatchNet & Router Integration

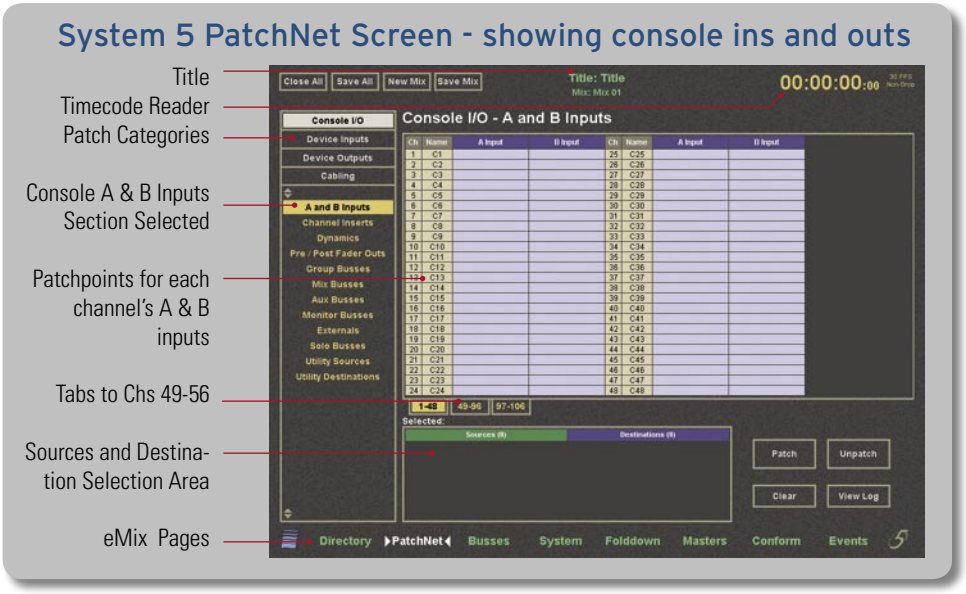
PatchNet Routing Software

The router in the DSP SuperCore is controlled by the PatchNet application which is simple to use and a very powerful digital audio patching system. PatchNet appears on an external screen with System 5 and on the central touch screen with Max Air.

Each of the MADI source and destination audio streams in the DSP SuperCore can be labelled, for example **Stage 1 Mics**, and each audio source within a MADI stream may also be individually labelled, for example **Mic 1**. All console inputs and outputs, for example **Channel 1 A Input**, also appear in PatchNet.

PatchNet is faster, easier and more flexible than an analog patchbay. Setups can be saved and recalled for each show, including a basic setup which includes all source and destination designations, as a starting point for new shows.

System 5 PatchNet Screen - showing console ins and outs



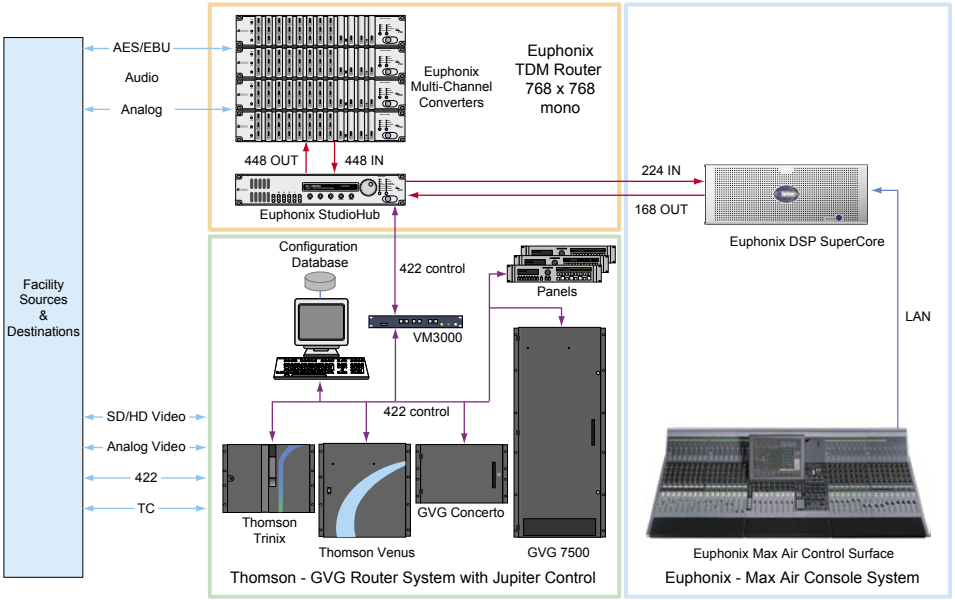
Integration with Broadcast Facility Routers

The Euphonix StudioHub, 2RU 12x12 MADI router can be added to the system, taking parallel MADI feeds of all console sources and destinations for distribution throughout the facility. StudioHub has been designed to communicate with most router control systems that utilize the ES-Switch protocol including Nvision, Pesa, Pro-bel, Sony, Grass Valley and Utah Scientific.

In some applications this ELIMINATES the need for two routing systems and two I/O systems while satisfying the demands of redundancy for on-air operation. The integration also simplifies patching, as the audio operator will no longer be required to patch console output busses to the destinations.

Console output busses such as main program, aux feeds, and IFB's automatically appear as sources on the router. Additionally, engineering then has full control of all audio sources from any router control panel, which means no more crowding the audio room during setup and troubleshooting for shows.

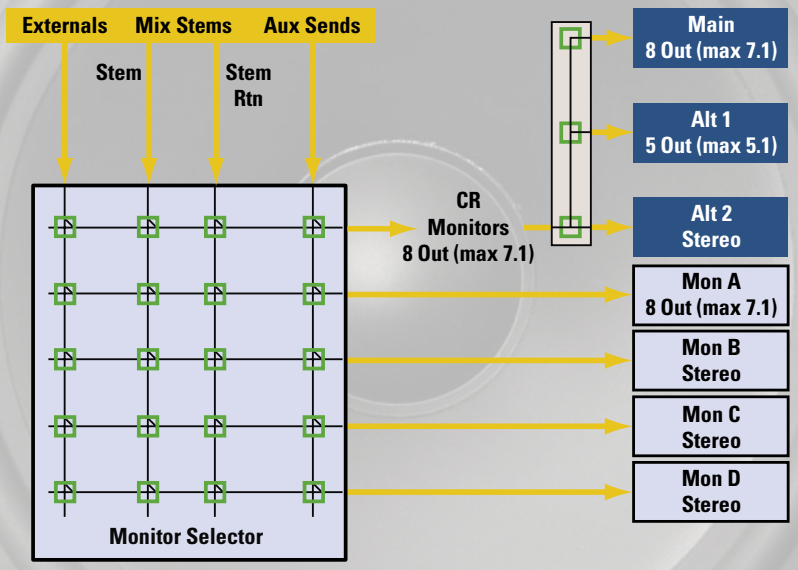
SH612 StudioHub Router



Other Features

Surround Monitoring

Both systems include a professional surround sound monitor matrix, the same surround facility used to dub Academy Award winning feature films. Source selection is made from dedicated controls and is very intuitive to operate as the matrix intelligently switches feeds in their correct format to the appropriate speakers. All formats up to 7.1 are supported. Matrix includes Main CR, Alt 1 & 2, 4 SLS speaker feeds, 32 External Monitor Playback Inputs, Buss outputs and returns, and Aux sends.



Multi-Format Control - Spill

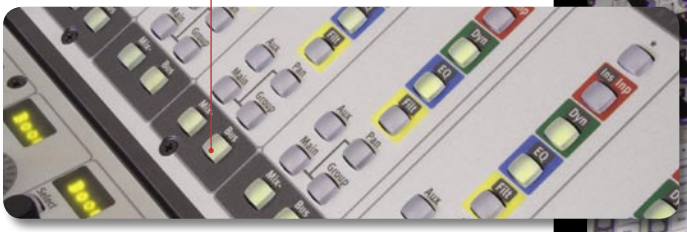
Each strip on the System 5 and Max Air can control a single source or a multi-format source or group such as a 5.1 network feed. This feed may be controlled on a single fader with linked EQ and dynamics processing to all the 6 elements. A Euphonix invention, the elements may be SPILLED out onto the surface at the push of a button, which allows the individual elements to be controlled separately as needed.

Events System and GPI

Both Max Air and System 5 feature an Event system as standard. The event system allows the control surface to interface with other equipment in the studio and for audio-follow video. Events can be surface parameters (i.e., channel on, fader position, etc.) or external inputs/outputs via the GP132 (General Purpose Interface). Multiple events may be combined for custom combinations.

N-1 Mix-Minus Bus

Both System 5 and Max Air (shown below) include a dedicated N-1 mix-minus bus. The Buss button for each strip includes that channel onto the mix-minus bus. A Mix-Minus button phase inverts the signal on the strip, adds it to the mix-minus bus, and routes the resultant N-1 feed to the channel's N-1 dedicated output.



Layouts

The position of sources on the console surface can be saved and recalled as Layouts. The operator can bring critical sources within easy reach and change Layouts at the push of a button between show segments making it easy to manage hundreds of sources on a smaller surface. Layouts take the stress out of mixing complex shows.

SnapShots

Console parameters such as a channel's complete settings or an element like an EQ's parameters may be saved to a SnapShot. This is very useful for saving different versions of an EQ, for example. SnapShots and Layouts may be named, saved and modified. The operator can also select what is to be included in a Layout or SnapShot.

ON-AIR with Euphonix

On Air

There are over 200 installations of Euphonix broadcast consoles throughout the world in many different broadcast applications. Both System 5 and Max Air are each suitable for any type of broadcast audio mixing, especially for HD where sound quality and surround are key factors in the choice of console.

Sports & OBs

For more complex sports applications System 5 is perfect due to its ultimate flexibility and visual feedback. MEDIAPRO's System 5 was used for mixing World Cup soccer audio. For OBs where physical space is a factor, but flexibility and sound cannot be sacrificed, such as TVM in Ireland, Max Air is the obvious choice.

News

News networks, such as CNN, and many local stations such as WMHT, choose Max Air. KNBC news in Los Angeles use a System 5 as a result of its compatibility with System 5 consoles on the *Tonight Show with Jay Leno* stage.

Production

System 5 is normally the choice for production, especially when shows include music recording such as KLRU's *Austin City Limits* show.

Live Venue & Audio Post

The System 5-BP is perfect for this application and has found favor with many top venues such as Sydney Opera House, Grand Ole Opry and Lakewood Church where there is a need to broadcast live and re-purpose shows for re-broadcast.

System 5-BP Model On-Air & Audio Post Applications

The System 5-BP has the same features as the System 5-B but with the addition of dynamic mix automation – the same automation of faders, knobs and SnapShots that is available on the Euphonix System 5 range of audio post and music mixing consoles. The System 5-BP includes the transport and automation panels at the bottom of the central CM401 Master Module.

Sales & Support

During the sales process our knowledgeable and experienced sales and product specialist staff can work with your installation team to exactly match a system to your requirements. Euphonix prides itself on excellent after sales support that is second-to-none. We will do whatever it takes to get you on-air and keep you on-air.

System 5 & Max Air DVDs

DVDs are available for both systems which include hands-on training in easy to access chapters plus a guided tour of the system. These video clips are also available online for fast access to operational training questions as they arise.

www.euphonix.com

Sports OB - MEDIAPRO

News - WMHT

Production - KLRU Austin City Limits

Live Venue & Post - Sydney Opera House

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